Oregon
Kate Brown, Governor

Water Resources Department
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Salem, OR 97301
(503) 986-0900
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May 30, 2017

Katrina Sutphin
1401 Alameda drive
Ontario, OR 97914

By Registered Mail

Re: Crowley Dam (C 10) – Special dam safety notice

This dam was inspected on May 2, 2017. I met you at the ranch, and your brother Billy was also there for the inspection. The Water Resources Department conducts routine inspections of the dam's exterior surfaces to identify conditions that might affect the safety of the dam. Dams are assigned a hazard rating based on downstream hazard to people and property, not on the condition of the dam. Crowley is classified as a high hazard dam and inspected annually.

Summary: The thin arch concrete dam has badly deteriorated and has not been maintained and operated and in a number of years. It is in UNSAFE condition, with a hole through it and significant cracking of the dam. As an unsafe dam, action is required very quickly. You asked me about, and we discussed, a short term fix and the requirement for an engineer to determine if such a fix is feasible. If repairs are not designed and stamped by a professional engineer and made this year, the valves need to be open or cut off so that the dam is unlikely to fill.

Results of Inspection:

Crowley reservoir on 5-2-17

The reservoir level was about 35 feet below the dam crest when inspected. Early this year, water had flowed over the crest of the dam for about a month. A full reservoir

results in hydraulic forces on the dam, and any offset in cracking could result in catastrophic failure.

Hole through dam appears larger

As noted in the last two inspection reports, the dam is no longer serviceable. Crowley dam has been allowed to deteriorate over the course of many years. The most significant changes to the dams' condition since the last inspection are the enlargement of the hole associated with a significant vertical crack in the face of the dam.

Downstream face showing cracks and leaks

As another reminder, concrete arch dams are likely to fail suddenly, catastrophically, and without warning. Removal of Crowley dam will be needed very soon even if short term repairs are possible. The two valves to control flow through the dam are below and

obscured by the leak, and are both inoperable. Unless a short term repair is designed by an engineer and completed very quickly, the valves need to be modified so that they remain fully open. Open pipes will greatly reduce the risk of the reservoir filling. It remains of critical importance to prevent water building up a hydraulic load on the arch of the dam where any movement could cause failure. Persons below the dam, including anyone in your house or on the road below the dam are at significant risk when the reservoir behind the dam is full.

The Crowley Dam site remains an excellent location for a dam. The natural channel constriction in conjunction with substantial hard rock abutments presents itself as a good candidate for a replacement project. While dangerous to leave the dam in its current condition, we are most willing to help explore any available options for its replacement.

Necessary Action: I would consider an engineered design a temporary repair that includes a time frame that the repair may be used. I would only consider a repair plan that is developed by and stamped by a professional engineer registered in Oregon. A list of potential engineers was e-mailed to you on May 9th of this year. **No later than June 20, 2017, send me the name of the engineer that will be working for you on this dam.** If an engineer is unable to develop a safe repair, valve removal is the only means of reducing risk at this dam. **If the valves cannot be opened, they should be cut off with a torch to keep them as open pipes through the dam.**

This has been a recurrent message. If action is not taken, Oregon laws ORS 540.350 to 390 must be applied if the dam becomes unsafe. This will include a formal notice of the dams' condition and a hearing to finalize an order for this dam.

We would encourage replacement of this structure, and will provide what assistance we can to that end. We use a standard inspection form, and a copy of the field inspection sheet for this dam is attached. Thanks again for meeting with me at the dam. **Please let me know as soon as you have an engineer working for you on possible short term stabilization of this dam.**

Sincerely,

Keith Mills

Keith Mills, P.E., State Engineer
(503) 986-0840
Cell (541) 706-0849

C: Ron Jacobs, Watermaster District 9
Dam Safety File C-10

Dam Safety
Inspection Form

State of Oregon
Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Name of Dam: Crowley File #: C-10
Height: 90 ft. Storage: 3,700 ac. ft. Permit: C14350 NID #: OR- 00132
Hazard: ☐ **Low** ☐ **Significant** ☑ **High** Inspector(s): Mills District: ____
Others on site: Kat, Sotphia - Ville
Date: 5-2-2017 Temperature: 70°F ☑ Dry ☐ Rain ☐ Snow ☐ Now ☐ Recently
Prior Inspection Date: 5-19-16 Issues from prior inspection: hole, cracking in arch concrete dam

***Rating Criteria**: 5-Exemplary; 4-Adequate 3-Maintenance or minor repair needed*
2-Serious repair needed; 1- ***Urgent dam safety issue – action now - Contact owner and dam safety directly***

General		**Rating**
Structures below dam	☐ New ☑ Existing ☐ **Request Dam Safety review of hazard rating**	
Distance to dam	Dwelling 150 feet Paved public road ____ feet Other building ____ feet	
Vehicle access	☐ All weather road ☑ Dirt road ☐ Cross country	3
Detail:		

Reservoir	**Pool level:** -35	**Point of Reference:** ☐ Crest ☐ Gage ____	**Rating**
Minimum freeboard	**Vertical distance from debris line to lowest place on crest** 0 **ft.**		1
Debris	☐ Floating Debris/Trash ☐ Log Boom ☐ Unusual Conditions clean		4
Detail:			

Spillway	☐ **Earth** ☐ **Rock** ☐ **Concrete** ☑ **Other** over top	**Rating**
Modifications	☑ **None** ☐ **Reduction in capacity** ☐ **Feature not on design**	—
Approach Channel	☑ Clear ☐ **Trees/brush** ☐ **Debris** ☐ Erosion	4
Control Section	☐ Concrete ☐ Rock ☐ Soil ☐ Culvert ☐ **Unstable** Width ____ Depth ____	—
Flashboards/Gate	☐ None ☐ In place ☐ Operational ☐ Deteriorated	—
Discharge Channel	☑ Clear ☐ Trees/brush ☐ Leakage ☐ **Headcutting** (____ feet from spillway control section, depth ____ feet.)	4
Stilling basin	☐ N/A ☐ Functional ☐ Minor Erosion ☐ **Severe Erosion/Undercutting**	—
Aux. Spillway	☐ Yes ☑ No (use comments below)	—
Detail:		

Seepage/Leakage		**Rating**
Serious conditions	☐ **Leakage** ☐ **Piping** ☐ **Discolored water** ☐ **Boils**	—
Locations*	☐ No evidence ☐ Center ☐ Left ☐ Right ☐ **Around pipe** ☐ On dam ____	—
Flow	☐ Wet vegetation ☐ Spongy ☐ Standing water ☐ Flow ____ gpm	—
Toe drains	☐ None ☐ Working ☐ Damaged ☐ Buried	—
Detail:	water flowing through hole ~ 8cfs	1

Conduit	Control: ☑ Manual ☐ Power ☐ Other ☐ Conduit Control missing		Rating
Inlet	☑ Submerged ☐ Debris on Trash Rack ☐ Deterioration		—
Trickle tube	☑ None ☐ Screened ☐ Blockage ☐ Deterioration		—
Control/Stem	☐ Operable ☐ Damaged ☐ Missing Not operable		2
Valve(s) cycling	☑ Frozen ☐ Unknown ☐ Past year ☐ Frequent		2
Pipe 2 gates	Diameter/Size: — Material —	Condition —	—
Primary outlet	☐ Overgrown ☐ Clean ☐ **Pressurized** ☐ Leaking _____ gpm		—
Other outlet(s)	☐ Yes ☐ No Type(s) twin pipes Diameter(s) _____ in.		—
Detail:	Non functional		

Structure of dam	☐ Earth ☐ Rock ☑ Concrete ☐ Other Arch	Rating
Distress	☑ **Cracks - offset** 2 **in** ☐ **Landslide(s)** ☐ **Sinkhole(s)** ☐ Crest Settlement ☐ Narrow crest ☐ Wave erosion ☐ Trampling ☐ Surface erosion Hole, cracks	1
Locations*	center	—
Other	Describe _____	
Aux. dike (s)	☐ No ☐ Yes ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ over 5	
Animals	☐ Nutria ☐ Badger Other _____ ☐ Unknown	**Rating**
Burrows	☐ Observed max diameter ____ in max depth ____ ft ☐ Trails None	—
Locations*	Not an issue	
Vegetation		**Rating**
Cover	☐ Low grass ☐ high grass ☐ brush ☐ blackberries ☐ small trees ☐ large trees NA	—
Locations*		
Impairs inspection	☐ toe seepage ☐ conduit outlet ☐ spillway ☐ upstream face ☐ downstream face	
Detail:	Not an issue	

***Locations** – Upstream face, Crest, Downstream face, Left and Right abutments, Toe*

Expedited Re-inspection Needed: ☐ Next Inspection Date: Fall 2017

Other Issues or Additional Detail Needed:

Remove valves or repair (short term) prior to wet season